

REMARKS/ARGUMENTS

Claims 1, 2, 4, 5, 8 to 10, 12 to 15 and 17 to 20 are currently pending in this application. Claim 2 has been amended with this response, and claim 3 has been canceled. No new matter has been added with these amendments.

Rejection Under 35 U.S.C. §112, Paragraph 1

The Examiner rejected the remaining pending claims as unpatentable under 35 U.S.C. §112, Paragraph 1 as failing to comply with the written description requirement. Specifically, the Examiner states that the disclosure never provides guidance on amorphous alloys that would meet all the claim limitations, and in particular that would be Ni, Be and Al free and have a glass transition temperature lower than 400 °C. Applicants respectfully traverse this rejection. The Examiner states that the “vast majority” of the alloys listed in the U.S. Patent Nos. 5,288,344; 5,368,659; 5,618,359 and 5,735,975 have at least one of the elements (Ni, Al & Be) excluded by the claims of the instant invention. Applicants respectfully disagree with the Examiner’s reading of the prior art.

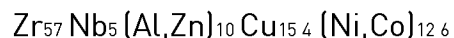
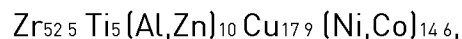
First, Applicants acknowledge that the original application was directed to dental prostheses made more broadly with amorphous materials, and that thus there were included in the patent disclosure references to prior art patents and publications directed to alloys that contain one or more of Ni, Al and/or Be. However, the claims of the instant application were also directed to dental prostheses made with amorphous alloys free of these elemental metals, and in turn Applicants included other references that clearly disclose such materials. In particular, while U.S. Patent Nos. 5,288,344 and 5,368,659 are both clearly directed to Be and Ni containing amorphous materials, U.S. Patent Nos. 5,618,359 and 5,735,975 not only do not require Be, they also do not require either Ni or Al.

For example, in describing the scope of the alloys disclosed therein, the authors of U.S. Patent No. 5,735,975 write:

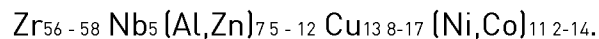
At least quinary alloys form metallic glass upon cooling below the glass transition temperature at a rate less than 10^3 K/s. Such alloys comprise zirconium and/or hafnium in the range of 45 to 65 atomic percent, titanium and/or niobium in the range of 4 to 7.5 atomic percent, and aluminum and/or zinc in the range of 5 to 15 atomic percent. The balance of the alloy compositions comprise copper, iron, and cobalt and/or nickel. ('975 Patent, Abstract.)

In short, the '975 patent makes it clear from the beginning that Be is not incorporated by the alloy and that both Ni and Al are optional and may be substituted by Co and Zn, respectively. The optional nature of the Ni and Al components is echoed in the claims and even in the statement of the "preferred compositions" where the authors write:

One example of a preferred alloy composition includes zirconium in the range of 52.5 to 57.5 atomic percent, 5 atomic percent of titanium and/or niobium, 7.5 to 12.5 atomic percent of aluminum and/or zinc, copper in the range of 15 to 19.3 atomic percent, and 11.6 to 16.4 atomic percent of nickel and/or cobalt. Other preferred alloy compositions can be represented by the following formulas:



and



('975 Patent, col. 4, lines 20-40.)

Likewise, U.S. Patent No. 5,618,359 is directed to amorphous materials having suitable heating and cooling characteristics that are also absolutely free of Be content. What is more, in the case of the '359 patent the alloys are also free of Al. The only of the prohibited elemental metals recited in the '359 patent is Ni; however, as in the '975 patent, Ni is always recited in the alternative and by the text of the patent may be

explicitly replaced with Co. For example, in stating the broadest formulation of their amorphous alloy the authors of the '359 patent write:

This can be stated by the formula $Ti_a(ETM)_b(Cu_{1-x}(LTM)_x)_c$

where ETM is selected from the group consisting of Zr and Hf, LTM is selected from the group consisting of Ni and Co, x is atomic fraction, and a, b, and c are atomic percentages, wherein a is in the range of from 19 to 41, b is in the range of from 4 to 21, and c is in the range of from 49 to 64. There are the additional constraints that $2 < x \cdot c < 14$ and $b < 10 + (11/17) \cdot (41 - a)$. Other constraints are that when $49 < c < 50$, then $x < 8$ when $50 < c < 52$, then $x < 9$ when $52 < c < 54$, then $x < 10$ when $54 < c < 56$, then $x < 12$ and when $c > 56$, then $x < 14$. ('359 Patent, col. 2, lines 54-66.)

Indeed, Ni is optional even in the alternative formulation of the alloys presented in the '359 patent, the disclosure of which states in relevant part:

Another group of glass forming alloys has the formula

$(ETM_{1-x}Ti_x)_aCu_b(Ni_{1-y}Co_y)_c$

where ETM is selected from the group consisting of Zr and Hf, x is atomic fraction, and a, b, and c are atomic percentages, wherein x is in the range of from 0.1 to 0.3, *y · c is in the range of from 0 to 18*, a is in the range of from 47 to 67, b is in the range of from 8 to 42, and c is in the range of from 4 to 37. This definition of the alloys has the additional constraints that (i) when a is in the range of from 60 to 67 and c is in the range of from 13 to 32, b is given by: $b \geq 8 + (12/7) \cdot (a - 60)$; (ii) when a is in the range of from 60 to 67 and c is in the range of from 4 to 13, b is given by: $b \geq 20 + (19/10) \cdot (76 - a)$; and (iii) when a is in the range of from 47 to 55 and c is in the range of from 11 to 37, b is given by: $b \geq 8 + (34/8) \cdot (55 - a)$. ('359 Patent, col. 2, line 67 to col. 3, line 15, italics added for emphasis.)

In summary, again the authors of the '359 patent make it clear that Ni is optional, and indeed interchangeable with Co. This is again reinforced by the claims, which also recite Ni as interchangeable with Co.

Accordingly, of the four patent references cited by Applicants in the disclosure as setting forth materials applicable for used in the claimed invention, fully half recite amorphous alloys having the requisite cooling characteristics and are or can be made

free of Be, Al and Ni. Given that the scope of the claims has been reduced during prosecution, Applicants would be willing to amend the disclosure to remove the references incorporated by reference that are no longer relevant.

Rejections Under 35 U.S.C. §112, Paragraph 2

The Examiner also rejected the remaining pending claims as unpatentable under 35 U.S.C. §112, paragraph 2 as indefinite. Specifically, the Examiner states that although claim 1 requires that the alloy be Ni, Be and Al free, claims 2 and 3 recite compositional formulas that include these elements. Applicants have amended claim 2 and canceled claim 3, to remove the conflicting claim requirements thereby obviating this rejection.

Obviousness-Type Double Patenting Rejections

The Examiner also maintained the rejection of all of the claims over claims 1 to 22 of Applicants' co-pending U.S. Patent Application No. 10/524,954, because of a typographical error in the previously submitted terminal disclaimer. Applicants submit herewith a new terminal disclaimer to overcome the subject rejection.

Conclusion

In view of the foregoing amendment and response, it is believed that the application is in condition for further examination. If any questions remain regarding the allowability of the application, Applicant would appreciate if the Examiner would advise the undersigned by telephone.

Respectfully submitted,

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